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QUARRY ACCIDENTS IN THE UNITED STATES

DURING THE CALENDAR YEAR 1911

COMPILED BY

ALBERT H. FAY

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QUARRY ACCIDENTS IN THE UNITED STATES DURING THE CALENDAR YEAR 1911.

Compiled by ALBERT H. FAY.

INTRODUCTION.

In proportion to the number of men employed, fatal accidents in quarries in the United States are about one-half as numerous as those in metal mines. This fact is brought out by the figures collected by the Bureau of Mines and presented on the following pages. Out of 110,954 men employed in and about quarries in the United States during the calendar year 1911, 188 men were killed, the death rate being 1.69 per 1,000 men employed, as compared with 3.73 per 1,000 men for the coal mines and 4.19 per 1,000 men for the metal mines of this country during the same period. In and about the quarries of Great Britain 79,010 men were employed during 1911, and of this number 85 were killed, the death rate being 1.08 per 1,000 men employed.

The following tables, giving the accidents in the quarries in the United States during 1911, have been compiled by the Bureau of Mines from reports received direct from the operators. The bureau's list of quarry operators contains about 7,500 names, representing all stages of the industry. In the collection of the statistics no distinction was made as regards the magnitude of the operations. The man who is operating a small quarry, supplying building material for domestic purposes, certainly encounters many of the dangers that surround the employees of the large operator. He is not usually able to obtain prompt medical aid and hospital service, nor has he the means of communicating with anyone in case of accident, since he often works alone; he does not always have the best of tools and apparatus, which tend toward safety, and for these reasons he should not be ignored when accident statistics are being collected.

The first requests for the information contained in this report were mailed early in January, 1912, the majority of which were cheerfully and promptly answered. Second, third, and fourth requests were sent to those who failed, from one cause or another, to respond. Eventually replies were received from about 88 per cent of the names on the list. A large number of quarries were reported as "idle," "abandoned," or "out of business." The statistics herein tabulated represent 3,920

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operators, who actually worked their quarries during the year. As far as can be ascertained, all of the large companies made out detailed reports, so that when measured by production the statistics given herein are representative of the industry. The small number who did not reply, while representing nearly 12 per cent of the names on the mailing list, form a much smaller percentage of the industry when compared on the basis of the amount of rock produced.

One reason why some operators did not reply, judging from many of the answers received, is that the quarry was small and no accidents occurred, and hence a reply was not necessary. It is hoped that every operator, whether large or small, will consider his property as worthy of a report regarding quarry accidents for the year 1912, and will give the number of men employed and the days worked. The true accident ratio for the whole country can be obtained only when complete reports are furnished. Each quarry that fails to report its five or six men reduces the total number "reported employed," and when State totals are obtained for the year they are entirely too small. It is believed that the fatal accidents were accurately reported. With all of the fatal accidents reported and all of the men employed accurately determined, the true death rate per 1,000 employed is easily obtained. However, if all of the fatalities are reported and only 90 per cent of the men employed are reported, the death rate will appear 11 per cent higher than it should. This is an injustice to the State, the industry, and the quarry operators, which can be removed by each operator making a complete report.

ACKNOWLEDGMENTS.

The acknowledgments of the bureau are due to the operators who have kindly furnished the information contained herein, and it is hoped that the bureau will continue to receive their hearty cooperation. The statistics for New York were furnished by W. W. Jones, State mine inspector, Albany, N. Y., to whom credit is herewith given.

PUBLICATION OF ACCIDENT STATISTICS.

In the publication of these statistics it is not the purpose of the bureau to usurp in any way the field covered by the annual or biennial reports of the various State inspectors or departments of labor. A number of States have no inspectors for quarries and there is a lack of uniformity in the reports issued by the States that have inspectors. The tabulated forms in which these statistics are published must be regarded as more or less tentative and subject to revision. The Bureau of Mines will be glad to receive suggestions from State inspectors and others interested in quarries as to the form in which the data can be presented most effectively and as to how the publication of the statistics can be made most useful to the quarry industry.

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SERIOUS AND SLIGHT INJURIES.

Only a few of the States collect statistics regarding serious injuries and still less give any attention whatever to slight injuries.

The definition of an accident, which is the fundamental question, is given differently by various quarry, mining, and industrial companies. One operator may require a detailed report of any casualty, however slight, that delays the worker or that draws blood; another may not consider an accident worthy of record that does not come to the attention of the foreman or shift boss. One of the large mining companies defines an accident as—

> Any internal or external injury, feigned or actual, involving any or no loss of time, resulting directly or indirectly from our operations, regardless of cause or degree of severity, occurring to the person of an employee while going to, coming from, or actually engaged on company work or property. It also includes an accident to any nonemployee resulting directly from any of our operations.[a]

The distinction between a serious and a slight injury is entirely arbitrary and is more or less tentative. A definite line had to be drawn, and hence a serious injury is considered in this report as one that disabled a man and kept him from duty 20 days or more. This class includes such injuries as broken arms and legs, loss of eye, or severe cuts and bruises.

A slight injury is considered as one that involved a loss of time of not less than 1 day nor more than 20 days. Under this class may be placed such injuries as cuts, sprains, mashed fingers, bruises, dirt in eye, slight burns, effect of powder smoke, etc. Of course any slight injury may become infected and thus cause a serious injury as defined above.

DETAILED TABULATION OF ACCIDENTS.

The tables in the following pages are arranged, according to the rock quarried, so as to represent seven classes of the quarry industry as follows: Granite, trap rock, sandstone and bluestone, limestone, marble, cement rock, and slate.

The tables show the number killed, seriously injured, and slightly injured, the number of operators reporting, number of men employed, both in and out of the quarry, days' labor performed, and the rates of deaths and injuries per 1,000 men employed.

A summary of the number employed in all of the quarries in the United States, with the number killed and injured, rate per 1,000 employed, and the number of widows and orphans is given in Table 1. The causes of these accidents, together with the percentage of accidents due to any one cause, are given in detail in Table 2.

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[a] From a technical paper by D. E. Woodbridge, now in course of publication by the Bureau of Mines.

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GRANITE QUARRIES.

The figures given in Tables 3, 4, 5, and 6 are compiled from reports of 605 operators employing 19,948 men, of whom 13,234 were employed in the quarry and 6,714 outside of the quarry. The total number of deaths and injuries due to accidents reported is as follows: Deaths, 29, or 1.45 per 1,000 men employed; serious injuries, 110, or 5.51 per 1,000; and slight injuries, 691, or 34.64 per 1,000.

SANDSTONE QUARRIES (INCLUDING BLUESTONE).

Tables 7, 8, 9, and 10 are compiled from reports of 686 operators employing 11,333 men, of whom 8,628 were employed in the quarry and 2,705 at the surface plants. The total number of deaths and injuries due to accidents reported is as follows: Deaths, 14, or 1.24 per 1,000 men employed; serious injuries, 42, or 3.71 per 1,000; and slight injuries, 225, or 19.85 per 1,000.

LIMESTONE QUARRIES.

The figures given in Tables 11, 12, 13, and 14 are compiled from the reports of 2,144 operators employing 54,576 men, of whom 40,740 were employed in the quarries and 13,836 outside of the quarries. The total number of deaths and injuries due to accidents reported is as follows: Deaths, 90, or 1.65 per 1,000 men employed; serious injuries, 436, or 7.99 per 1,000; and slight injuries, 2,338, or 42.84 per 1,000.

CEMENT ROCK.

The cement-rock quarries are represented by 93 operators, who employed 7,593 men during 1911. The number of deaths and injuries due to accidents reported is as follows: Deaths, 29, or 3.82 per 1,000 men employed; serious injuries, 150, or 19.75 per 1,000; and slight injuries, 851, or 112 per 1,000. While the ratio for the cement-rock quarries is high as compared with those of the other classes of quarries, there does not seem to be any special reason for the difference. It is, however, probably due to the fact that the cement quarries are operated on a larger scale and that better records of serious and slight injuries are kept and more detailed reports are rendered. Many of the small quarries do not keep any record of the serious and slight injuries, hence the seemingly low accident ratio. Moreover, many deaths are reported from memory rather than from record.

The average number of men employed in the cement-rock quarries is about 80 to the quarry. The slate quarries rank next, employing 50 men to the quarry. The others range from 40 down to 20 men. No large accidents in which two or more men were killed were reported by the cement-rock quarry operators. The deaths and injuries appear to have been received during the regular course of operations. The percentage of accidents due to any one cause is given in Tables 19, 20, and 21.

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QUARRY ACCIDENT STATISTICS, BY STATES.

A compilation of the quarry accident statistics, by States, is given in Tables 15, 16, 17, and 18. These tables contain the combined reports of all the quarries, representing 3,920 operators. The total number of men employed was 110,954, of whom 79,897 were employed in the quarries and 31,075 outside of the quarries. The total number of fatalities, serious injuries, and slight injuries due to accidents reported is as follows: Deaths, 188, or 1.69 per 1,000 men employed; serious injuries, 862, or 7.77 per 1,000; slight injuries, 4,528, or 40.81 per 1,000 men employed.

CAUSES AND DISTRIBUTION OF ACCIDENTS.

In Tables 19, 20, and 21 is given the percentage of accidents due to any one cause in each class of quarries and for all of the quarries combined. It will be noted, for instance, that in granite quarries 17.24 per cent of the deaths, 14.54 per cent of the serious injuries, and 4.20 per cent of the slight injuries were due to the use of explosives. A similar comparison may be made for any class of quarries for any one of the 14 causes enumerated. These tables also show that approximately one-half of the deaths in and about the quarries are due to the following three causes in the order named: Explosives, falls or slides of quarry material, and falls or slides of overburden. Approximately 33 per cent of both the serious and slight injuries occurred in the handling and transport of material. The next largest cause of nonfatal injuries was falls or slides of quarry material, which amounted to slightly more than 16 per cent of the total.

QUARRY, COAL-MINE, AND METAL-MINE ACCIDENTS COMPARED.

The figures compiled by the Bureau of Mines show that the total number of men employed in the quarry industry in 1911 was 110,954, of whom 188 were killed, making the death rate 1.69 per 1,000 men employed. The total number of men employed in or about the coal mines in the United States was 728,348, and of this number 2,719 were killed, or 3.73 per 1,000 employed. The metal mines employed 165,979 men, of whom 695 were killed, or 4.19 per 1,000 men epmloyed, as shown in Table 22.

In both the metal and coal mines from 32 to 48 per cent of the fatalities were due to falls of roof, wall rock, ore, or coal. Quarry work is performed in the open, and hence is less exposed to this hazard, yet falls of rock or overburden caused 25 per cent of the accidents reported for 1911. The principal source of danger in quarrying appears to be explosives; the handling and transportation of the material produced in the quarry ranks third. The quarry man is not exposed to the danger of mine fires, which are responsible for many of the deaths in coal and metal mines.

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Table 23 shows by percentages the proportion of deaths and serious injuries due to any one cause in quarries, coal and metal mines. These figures are combined so as to include both surface and underground work in the mines and inside and outside work in the quarries. Some of the causes are more or less grouped, but the same grouping has been maintained for each industry. For example, haulage and handling of rock, ore, or coal includes accidents from all cars, locomotives, animals, or derricks or other appliances used for such work.

It will be noted that the proportion of men killed by explosives in quarries is more than twice as large as the proportion for metal mines and almost five times as great as that for coal mines.

VALUE OF QUARRY PRODUCTS.

The following table, compiled from statistics published by the United States Geological Survey, is printed to show the magnitude of the quarrying industry in the United States.

Value of the quarry products of the United States, 1910 and 1911.

Quarry.	1910	1911	Quarry.	1910	1911
Granite[a]	$20,541,967	$21,533,747	Marble[a]	$6,992,779	$7,546,718
Trap rock[a]	6,452,141	6,399,622	Cement rock[b]	[c]68,752,092	[c]66,705,136
Sandstone and bluestone[a]	7,930,019	7,730,868	Slate[d]	6,236,759	5,728,019
Limestone[a]	34,603,678	33,897,612	Total	151,509,435	149,541,722

[a] Burchard, E. F., Stone: Mineral Resources U. S. for 1911, U. S. Geol. Survey 1912, Pt. II, p. 744.
[b] Burchard, E. F., Cement: Mineral Resources U. S. for 1911, U. S. Geol. Survey 1912, Pt. II, p. 485.
[c] Value of finished product.
[d] Coons, A. T., Slate: Mineral Resources U. S. for 1911, U. S. Geol. Survey 1912, Pt. II, p. 723.

TABLE 1.—*Number of men employed, and number of men killed and injured in and about quarries in the United States in the calendar year 1911.*

Quarries.	Operators reporting.	Employed.	Killed.		Seriously injured.		Slightly injured.		Widows.	Orphans.
			Total.	Rate per 1,000 employed.	Total.	Rate per 1,000 employed.	Total.	Rate per 1,000 employed.		
Granite	605	19,948	29	1.45	110	5.51	691	34.64	9	8
Traprock	150	6,337	8	1.26	74	11.68	242	37.89	4	5
Sandstone and bluestone	686	11,333	14	1.24	42	3.69	225	19.85	6	8
Limestone	2,144	54,576	90	1.65	436	7.99	2,338	42.84	48	75
Marble	80	3,147	2	.63	15	4.77	107	34.00	1	0
Cement rock	93	7,593	29	3.82	150	19.75	851	112.08	12	14
Slate	162	8,020	16	1.99	35	4.36	74	9.22	9	19
Total and average	3,920	110,954	188	1.69	862	7.77	4,528	40.81	89	129

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TABLE 2.—*Number of men killed and injured in and about quarries in the United States during 1911, and the percentage of accidents due to each cause.*

Quarries.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	**Total killed and injured.**	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	**Total killed and injured.**	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Killed:																	
Granite	5	5	5	2	2	.....	2	**21**	1	3	2	.....	.....	.....	2	**8**	**29**
Trap rock	3	2	.....	1	.....	.....	.....	**6**	1	.....	1	.....	.....	.....	.....	**2**	**8**
Sandstone[a]	2	.....	1	3	5	.....	.....	**11**	.....	.....	1	.....	2	.....	.....	**3**	**14**
Limestone	10	9	27	9	6	.....	1	**62**	6	3	11	3	1	2	2	**28**	**90**
Marble	.....	.....	.....	.....	1	.....	1	**2**	.....	.....	.....	.....	.....	.....	.....	**0**	**2**
Cement rock	2	7	7	2	.....	.....	1	**19**	3	1	2	.....	.....	.....	4	**10**	**29**
Slate	.....	3	6	3	2	.....	1	**15**	.....	.....	.....	1	.....	.....	.....	**1**	**16**
Total	22	26	46	20	16	0	6	**136**	11	7	17	4	3	2	8	**52**	**188**
Percentage[b]	11.70	13.83	24.47	10.64	8.51	.....	3.19	72.34	5.85	3.72	9.04	2.13	1.60	1.06	4.26	27.66	100.00
Percentage[c]	16.18	19.12	33.82	14.71	11.76	.....	4.41	100.00	21.15	13.46	32.69	7.69	5.77	3.85	15.39	100.00	.....
Seriously injured:																	
Granite	8	10	16	35	10	1	7	**87**	6	.....	6	.....	1	.....	10	**23**	**110**
Trap rock	5	18	12	21	6	.....	2	**64**	4	1	3	.....	.....	.....	2	**10**	**74**
Sandstone[a]	9	7	8	7	5	.....	3	**39**	.....	.....	2	.....	.....	.....	1	**3**	**42**
Limestone	29	65	70	123	26	2	48	**363**	8	4	34	1	.....	2	24	**73**	436
Marble	.....	.....	1	12	1	.....	1	**15**	.....	.....	.....	.....	.....	.....	.....	**0**	**15**
Cement rock	11	32	13	57	7	.....	13	**133**	9	.....	4	.....	.....	.....	4	**17**	**150**
Slate	3	6	8	4	6	.....	1	**28**	1	.....	3	.....	.....	.....	3	**7**	**35**
Total	65	138	128	259	61	3	75	**729**	28	5	52	1	1	2	44	**133**	**862**
Percentage[b]	7.54	16.01	14.85	30.04	7.08	.35	8.70	84.57	3.25	.58	6.03	.12	.12	.23	5.10	15.43	100.00
Percentage[c]	8.91	18.93	17.56	35.53	8.37	.41	10.29	100.00	21.05	3.76	39.10	.75	.75	1.51	33.08	100.00	.....
Slightly injured:																	
Granite	30	96	29	263	46	.....	93	**557**	12	5	27	9	.....	1	80	**134**	**691**
Trap rock	34	44	11	61	16	.....	34	**200**	2	4	22	3	.....	3	8	**42**	**242**
Sandstone[a]	35	29	3	90	24	1	18	**200**	4	3	7	.....	2	.....	9	**25**	**225**
Limestone	122	413	125	689	121	16	365	**1,851**	50	36	136	3	.....	5	257	**487**	**2,338**
Marble	.....	.....	.....	62	12	2	18	**94**	3	.....	10	.....	.....	.....	.....	**13**	**107**
Cement rock	79	167	35	361	33	.....	70	**745**	13	3	48	1	1	7	33	**106**	**851**
Slate	18	18	10	10	5	.....	.....	**61**	.....	.....	9	.....	.....	1	3	**13**	**74**
Total	318	767	213	1,536	257	19	598	**3,708**	84	51	259	16	3	17	390	**820**	**4,528**
Percentage[b]	7.02	16.94	4.70	33.92	5.68	.42	13.21	81.89	1.85	1.13	5.72	.35	.07	.38	8.61	18.11	100.00
Percentage[c]	8.58	20.69	5.74	41.42	6.93	.51	16.13	100.00	10.24	6.22	31.59	1.95	.37	2.07	47.56	100.00	.....

[a] Includes bluestone. [b] Of grand total. [c] Of total inside and total outside.

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TABLE 3.—*Number of men killed in and about* ***granite*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total killed.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total killed.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
California	4	1	3		1			9								0	9
Colorado								0		2						2	2
Connecticut								0								0	0
Delaware								0								0	0
Georgia				1				1								0	1
Maine								0								0	0
Maryland								0							1	1	1
Massachusetts								0			2				1	3	3
Minnesota								0								0	0
Missouri								0								0	0
New Hampshire								0								0	0
New Jersey								0								0	0
New York								0								0	0
North Carolina		2						2								0	2
Oklahoma								0								0	0
Oregon		2	1					3								0	3
Pennsylvania								0								0	0
Rhode Island								0								0	0
South Carolina								0		1						1	1
Texas								0								0	0
Vermont			1		1			2	1							1	3
Virginia								0								0	0
Washington	1			1			2	4								0	4
Wisconsin								0								0	0
Other States [a]								0								0	0
Total	5	5	5	2	2	0	2	21	1	3	2	0	0	0	2	8	29

[a] Includes Arizona, Arkansas, District of Columbia, Idaho, Montana, Nevada, New Mexico, South Dakota, Utah, and Wyoming.

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TABLE 4.—*Number of men seriously injured in and about* ***granite*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total seriously injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total seriously injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
California	1	2	3	.....	2	.....	1	9	.....	.....	3	.....	.....	.....	.....	3	12
Colorado	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Connecticut	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Delaware	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Georgia	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Maine	.....	1	.....	5	.....	.....	1	7	.....	.....	.....	.....	.....	.....	3	3	10
Maryland	.....	2	3	1	.....	.....	.....	6	1	.....	.....	.....	1	.....	.....	2	8
Massachusetts	.....	4	1	4	2	.....	2	13	.....	.....	.....	.....	.....	.....	3	3	16
Minnesota	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Missouri	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	0	1
New Hampshire	.....	.....	.....	1	1	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	0	2
New Jersey	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
New York	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
North Carolina	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Oklahoma	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Oregon	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Pennsylvania	.....	.....	.....	1	.....	.....	1	2	.....	.....	.....	.....	.....	.....	.....	0	2
Rhode Island	5	.....	.....	.....	.....	1	.....	6	.....	.....	.....	.....	.....	.....	.....	0	6
South Carolina	.....	.....	.....	1	.....	.....	1	2	.....	.....	.....	.....	.....	.....	.....	0	2
Texas	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Vermont	.....	1	3	6	2	.....	.....	12	.....	.....	2	.....	.....	.....	1	3	15
Virginia	.....	.....	1	3	1	.....	.....	5	4	.....	.....	.....	.....	.....	.....	4	9
Washington	2	.....	1	5	1	.....	.....	9	.....	.....	.....	.....	.....	.....	1	1	10
Wisconsin	.....	.....	2	4	.....	.....	.....	6	1	.....	1	.....	.....	.....	2	4	10
Other States[a]	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	0	1
Total	8	10	16	35	10	1	7	87	6	.....	6	.....	1	.....	10	23	110

[a] Includes Arizona, Arkansas, District of Columbia, Idaho, Montana, Nevada, New Mexico, South Dakota, Utah, and Wyoming.

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TABLE 5.—*Number of men slightly injured in and about* ***granite*** *quarries in the United States during 1911.*

State	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total slightly injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total slightly injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
California	.....	1	3	4	1	.....	.....	9	.....	.....	.....	.....	.....	.....	.....	0	9
Colorado	.....	.....	.....	1	2	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	0	3
Connecticut	.....	.....	.....	5	.....	.....	3	8	.....	.....	.....	.....	.....	.....	.....	0	8
Delaware	.....	.....	.....	10	.....	.....	1	11	.....	.....	.....	.....	.....	.....	.....	0	11
Georgia	10	10	.....	17	7	.....	.....	44	5	.....	10	.....	.....	.....	1	16	60
Maine	1	1	.....	5	.....	.....	.....	7	.....	.....	1	.....	.....	.....	.....	1	8
Maryland	.....	5	.....	17	2	.....	.....	24	3	.....	3	.....	.....	.....	.....	6	30
Massachusetts	3	7	6	31	10	.....	7	64	.....	.....	4	.....	.....	1	24	29	93
Minnesota	.....	23	4	.....	2	.....	.....	29	2	.....	.....	.....	.....	.....	.....	2	31
Missouri	.....	.....	.....	.....	2	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	0	2
New Hampshire	1	2	.....	4	1	.....	1	9	.....	.....	.....	1	.....	.....	.....	1	10
New Jersey	.....	3	.....	1	2	.....	1	7	.....	.....	.....	.....	.....	.....	.....	0	7
New York	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1	.....	.....	.....	.....	1	2
North Carolina	.....	2	4	91	.....	.....	27	124	.....	.....	1	.....	.....	.....	3	4	128
Oklahoma	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Oregon	2	1	2	3	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	0	8
Pennsylvania	1	.....	.....	4	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	0	5
Rhode Island	3	2	.....	3	.....	.....	1	9	.....	.....	.....	.....	.....	.....	.....	0	9
South Carolina	.....	.....	.....	32	.....	.....	.....	32	.....	2	.....	.....	.....	.....	4	6	38
Texas	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Vermont	6	2	2	13	10	.....	50	83	2	.....	3	.....	.....	.....	42	47	130
Virginia	2	3	2	10	2	.....	2	21	.....	2	.....	.....	.....	.....	.....	2	23
Washington	1	34	.....	12	2	.....	.....	49	.....	.....	.....	.....	.....	.....	2	2	51
Wisconsin	.....	.....	6	.....	2	.....	.....	8	.....	1	4	8	.....	.....	2	15	23
Other States [a]	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	2	2	2
Total	30	96	29	263	46	.....	93	557	12	5	27	9	.....	1	80	134	691

[a] Includes Arizona, Arkansas, District of Columbia, Idaho, Montana, Nevada, New Mexico, South Dakota, Utah, and Wyoming.

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TABLE 6.—*Number of men employed, days worked, and number of men killed and injured per 1,000 men employed in and about* ***granite*** *quarries in the United States during 1911.*

State.	Operators reporting.	Employees.		Total.	Days' work performed.	Average number of days worked.	Killed.		Seriously injured.		Slightly injured.		Widows.	Orphans.
		In quarry.	Outside of quarry.				Total.	Per 1,000 employed.	Total.	Per 1,000 employed.	Total.	Per 1,000 employed.		
California	40	602	146	748	161,654	216	9	12.03	12	16.04	9	12.03	3	0
Colorado	11	74	25	99	28,218	285	2	20.20	1	10.10	3	30.30	0	0
Connecticut	34	391	348	739	125,233	169	0	.....	1	1.35	8	10.83	0	0
Delaware	4	198	72	270	61,815	229	0	.....	1	3.70	11	40.74	0	0
Georgia	25	976	319	1,295	189,801	147	1	.77	0	.....	60	46.33	0	0
Maine	73	1,164	888	2,052	498,969	243	0	.....	10	4.87	8	3.90	0	0
Maryland	15	689	231	920	176,931	192	1	1.09	8	8.70	30	32.61	0	0
Massachusetts	79	1,250	1,048	2,298	571,720	249	3	1.31	16	6.96	93	40.47	2	3
Minnesota	32	491	369	860	176,299	205	0	.....	1	1.16	31	36.05	0	0
Missouri	8	106	40	146	30,490	209	0	.....	1	6.85	2	13.70	0	0
New Hampshire	29	702	395	1,097	254,189	232	0	.....	2	1.82	10	9.12	0	0
New Jersey	10	165	10	175	37,731	216	0	.....	0	.....	7	40.00	0	0
New York	14	176	12	188	36,331	193	0	.....	0	.....	2	10.64	0	0
North Carolina	24	876	396	1,272	322,086	253	2	1.57	1	.79	128	100.63	0	0
Oklahoma	4	20	21	41	9,831	240	0	.....	0	.....	0	.....	0	0
Oregon	18	281	76	357	64,158	180	3	8.40	1	2.80	8	22.41	0	0
Pennsylvania	35	606	211	817	192,042	235	0	.....	2	2.45	5	6.12	0	0
Rhode Island	14	370	559	929	241,104	260	0	.....	6	6.46	9	9.69	0	0
South Carolina	11	306	83	389	98,377	253	1	2.57	2	5.14	38	97.69	1	0
Texas	9	116	23	139	35,771	257	0	.....	0	.....	0	.....	0	0
Vermont	41	1,179	162	1,341	360,964	269	3	2.24	15	11.19	130	96.94	1	4
Virginia	23	667	105	772	174,209	226	0	.....	9	11.66	23	29.79	0	0
Washington	23	895	222	1,117	236,702	212	4	3.58	10	8.95	51	45.66	2	1
Wisconsin	17	815	895	1,710	410,203	240	0	.....	10	5.85	23	13.45	0	0
Other States [a]	12	119	58	177	33,035	187	0	.....	1	5.65	2	11.30	0	0
Total	605	13,234	6,714	19,948	4,527,863	227	29	1.45	110	5.51	691	34.64	9	8

[a] Includes Arizona, Arkansas, Idaho, Montana, Nevada, New Mexico, South Dakota, and Utah.

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TABLE 7.—*Number of men killed in and about* ***sandstone*** [a] *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total killed.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total killed.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Arizona								0								0	0
Arkansas								0								0	0
California								0								0	0
Colorado	1							1								0	1
Connecticut				1				1								0	1
Idaho								0								0	0
Illinois								0								0	0
Iowa								0								0	0
Kansas								0								0	0
Kentucky								0								0	0
Massachusetts								0			1					1	1
Minnesota								0								0	0
Missouri								0								0	0
New Jersey								0								0	0
New York								0								0	0
Ohio				2	1			3					2			2	5
Oklahoma								0								0	0
Pennsylvania	1		1		3			5								0	5
South Dakota								0								0	0
Texas								0								0	0
Utah								0								0	0
Virginia								0								0	0
Washington								0								0	0
West Virginia								0								0	0
Wisconsin								0								0	0
Wyoming								0								0	0
Other States [b]					1			1								0	1
Total	2	0	1	3	5	0	0	11			1		2			3	14

[a] Includes bluestone.
[b] Includes Alabama, Florida, Indiana, Maryland, Michigan, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oregon, and Tennessee.

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TABLE 8.—*Number of men seriously injured in and about* **sandstone** [a] *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total seriously injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total seriously injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Arizona								0								0	0
Arkansas								0								0	0
California								0								0	0
Colorado	4		4					8								0	8
Connecticut					2			2								0	2
Idaho								0								0	0
Illinois								0								0	0
Iowa								0								0	0
Kansas								0								0	0
Kentucky			1		1			2								0	2
Massachusetts	1						1	2								0	2
Minnesota								0			1					1	1
Missouri								0								0	0
New Jersey		1						1								0	1
New York		2		3				5							1	1	6
Ohio		2	2	2				6								0	6
Oklahoma								0								0	0
Pennsylvania	2	2		2	2		1	9			1					1	10
South Dakota	1							1								0	1
Texas								0								0	0
Utah								0								0	0
Virginia								0								0	0
Washington	1						1	2								0	2
West Virginia								0								0	0
Wisconsin								0								0	0
Wyoming								0								0	0
Other States [b]			1					1								0	1
Total	9	7	8	7	5		3	39			2				1	3	42

[a] Includes bluestone.
[b] Includes Alabama, Florida, Indiana, Maryland, Michigan, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oregon, and Tennessee.

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TABLE 9.—*Number of men slightly injured in and about* ***sandstone*** [a] *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total slightly injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total slightly injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Arizona								0								0	0
Arkansas		2		9	1			12								0	12
California								0								0	0
Colorado		2		14				16								0	16
Connecticut				1				1								0	1
Idaho								0								0	0
Illinois		2		1				3		1						1	4
Iowa								0								0	0
Kansas								0								0	0
Kentucky				1	2	1	1	5								0	5
Massachusetts				9	1			10							2	2	12
Minnesota		1		7			1	9								0	9
Missouri		1						1								0	1
New Jersey		1					2	3							1	1	4
New York		1		11	1		5	18			3				2	5	23
Ohio	12	1		19	8		5	45	2		3		2		3	10	55
Oklahoma								0								0	0
Pennsylvania	5	5		9	8		3	30		1						1	31
South Dakota		7	2		1			10	1						1	2	12
Texas								0								0	0
Utah								0	1							1	1
Virginia				1				1								0	1
Washington	7	1		1			1	10								0	10
West Virginia	3			2	1			6								0	6
Wisconsin		2		4				6								0	6
Wyoming				1				1								0	1
Other States [b]	8	3	1		1			13		1	1					2	15
Total	35	29	3	90	24	1	18	200	4	3	7		2		9	25	225

[a] Includes bluestone.
[b] Includes Alabama, Florida, Indiana, Maryland, Michigan, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oregon, and Tennessee.

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TABLE 10.—*Number of men employed, days worked, and number of men killed and injured per 1,000 men employed in and about* ***sandstone***[a] *quarries in the United States during 1911.*

State.	Operators reporting.	Employees.		Total.	Days' work performed.	Average number of days worked.	Killed.		Seriously injured.		Slightly injured.		Widows.	Orphans.
		In quarry.	Outside of quarry.				Total.	Per 1,000 employed.	Total.	Per 1,000 employed.	Total.	Per 1,000 employed.		
Arizona	5	24	6	30	9,906	330	0	.....	0	.....	0	.....	0	0
Arkansas	14	207	22	229	24,783	108	0	.....	0	.....	12	52.40	0	0
California	12	64	13	77	9,978	130	0	.....	0	.....	0	.....	0	0
Colorado	26	172	22	194	45,114	233	1	5.15	8	41.24	16	82.47	0	0
Connecticut	5	201	8	209	51,160	245	1	4.78	2	9.57	1	4.78	0	0
Idaho	8	63	10	73	6,177	85	0	.....	0	.....	0	.....	0	0
Illinois	4	39	9	48	6,412	134	0	.....	0	.....	4	83.33	0	0
Iowa	4	8	3	11	1,072	97	0	.....	0	.....	0	.....	0	0
Kansas	8	101	57	158	25,035	158	0	.....	0	.....	0	.....	0	0
Kentucky	7	156	39	195	38,235	196	0	.....	2	10.26	5	25.64	0	0
Massachusetts	9	157	93	250	45,822	183	1	4.00	2	8.00	12	48.00	0	0
Minnesota	5	251	120	371	72,490	195	0	.....	1	2.70	9	24.26	0	0
Missouri	7	78	64	142	15,448	109	0	.....	0	.....	1	7.04	0	0
Montana	4	47	2	49	11,070	226	0	.....	0	.....	0	.....	0	0
New Jersey	9	143	23	166	43,035	259	0	.....	1	6.02	4	24.10	0	0
New York	177	1,604	532	2,136	415,072	194	0	.....	6	2.81	23	10.77	0	0
Ohio	54	1,820	467	2,287	565,766	247	5	2.19	6	2.62	55	24.05	4	3
Oklahoma	7	18	10	28	3,532	126	0	.....	0	.....	0	.....	0	0
Pennsylvania	206	2,142	662	2,804	543,874	194	5	1.78	10	3.57	31	11.06	2	5
South Dakota	12	131	116	247	62,824	254	0	.....	1	4.05	12	48.58	0	0
Texas	4	41	56	97	24,350	251	0	.....	0	.....	0	.....	0	0
Utah	7	35	24	59	8,005	136	0	.....	0	.....	1	16.95	0	0
Virginia	5	61	17	78	9,662	124	0	.....	0	.....	1	12.82	0	0
Washington	5	277	26	303	70,450	233	0	.....	2	6.60	10	33.00	0	0
West Virginia	25	293	61	354	54,538	154	0	.....	0	.....	6	16.95	0	0
Wisconsin	34	199	47	246	43,709	178	0	.....	0	.....	6	24.39	0	0
Wyoming	6	33	10	43	8,506	198	0	.....	0	.....	1	23.26	0	0
Other States[b]	17	263	186	449	93,231	208	1	2.23	1	2.23	15	33.41	0	0
Total	686	8,628	2,705	11,333	2,309,256	204	14	1.24	42	3.71	225	19.85	6	8

[a] Includes bluestone. [b] Includes Alabama, Florida, Indiana, Maryland, Michigan, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oregon, and Tennessee.

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TABLE 11.—*Number of men killed in and about* ***limestone*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total killed.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total killed.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Killed:																	
Alabama		2						2								0	2
Arizona								0								0	0
Arkansas								0				1				1	1
California		3			1			4								0	4
Colorado								0								0	0
Georgia								0								0	0
Illinois			7		2			9			2				1	3	12
Indiana				1	1		1	3		1				2		3	6
Iowa				3				3				1				1	4
Kansas					1			1								0	1
Kentucky			2					2	1		1					2	4
Maine					1			1								0	1
Maryland	1		2	1				4			1					1	5
Massachusetts								0								0	0
Michigan								0					1			1	1
Minnesota				1				1	1							1	2
Missouri	2	1	3					6		1						1	7
Montana								0								0	0
Nebraska			3					3								0	3
New Jersey								0								0	0
New Mexico								0								0	0
New York		1	1					2			1					1	3
North Carolina								0								0	0
Ohio			4	2				6	2		1				1	4	10
Oklahoma								0								0	0
Oregon								0								0	0
Pennsylvania	2	2	2	1				7			4					4	11
Tennessee	2							2	1							1	3
Texas			1					1								0	1
Utah	1							1								0	1
Vermont								0								0	0
Virginia								0		1						1	1
Washington			1					1								0	1
West Virginia								0	1							1	1
Wisconsin	1		1					2			1	1				2	4
Other States [a]	1							1								0	1
Total	10	9	27	9	6	0	1	62	6	3	11	3	1	2	2	28	90

[a] Includes Connecticut, Florida, Idaho, Louisiana, Nevada, Rhode Island, South Carolina, South Dakota, Wyoming, and District of Columbia.

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TABLE 12.—*Number of men seriously injured in and about* ***limestone*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total seriously injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total seriously injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Seriously injured:																	
Alabama								0								0	0
Arizona			2			1		3								0	3
Arkansas								0			1					1	1
California		3		2			1	6								0	6
Colorado		1	1	1				3								0	3
Georgia				1				1								0	1
Illinois	1	4	8	14	3		1	31	3	2	4			1	7	17	48
Indiana	2	2	1	10	5		12	32			4				1	5	37
Iowa				1	1			2								0	2
Kansas		1	4	4				9								0	9
Kentucky	1		8	4	1			14			1			1	2	4	18
Maine	1	2						3							1	1	4
Maryland		1	1				1	3			6					6	9
Massachusetts		1		1				2								0	2
Michigan		2	5	6	2			15			5				1	6	21
Minnesota	2							2								0	2
Missouri	4	5	5	6	1		1	22	1			1				2	24
Montana	1	1		1				3								0	3
Nebraska								0								0	0
Nevada								0								0	0
New Jersey		2	1	10	1			14								0	14
New Mexico				4				4								0	4
New York	2	11	5	9		1	6	34			1				4	5	39
North Carolina								0								0	0
Ohio	1	3	10	11	3		7	35	3		4				6	13	48
Oklahoma	3		2	7			10	22								0	22
Oregon		1						1								0	1
Pennsylvania	4	20	8	11	1		7	51	1	1	2				1	5	56
Tennessee	3	2	5	2			1	13			1					1	14
Texas		1	1	4				6			1					1	7
Utah	1	1		7	1			10								0	10
Vermont			1					1			1					1	2
Virginia	1				3			4			1					1	5
Washington					1			1								0	1
West Virginia		1		2				3		1	1					2	5
Wisconsin	1		1	5	3		1	11			1				1	2	13
Other States [a]	1		1					2								0	2
Total	29	65	70	123	26	2	48	363	8	4	34	1		2	24	73	436

[a] Includes Connecticut, Florida, Idaho, Louisiana, Nevada, Rhode Island, South Carolina, South Dakota, Wyoming, and District of Columbia.

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TABLE 13.—*Number of men slightly injured in and about* ***limestone*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total slightly injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total slightly injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Slightly injured:																	
Alabama	7	15	1	23	3			49		1	4					5	54
Arizona			7	3		3		13								0	13
Arkansas	1							1			4	3				7	8
California	2	21	2	22	5		1	53		2	1					3	56
Colorado	1	1		10				12								0	12
Georgia	5	20					1	26								0	26
Illinois	7	72	5	103	15	6	34	242	31	8	17			4	70	130	372
Indiana	7	21	6	84	27	6	75	226	2	10	44				60	116	342
Iowa	2	11	4	26	1			44								0	44
Kansas	2	1	2	9			4	18			3					3	21
Kentucky	3	18	8	10			2	41							2	2	43
Maine	3	1	2	6				12		3						3	15
Maryland	4	4	6	5	5		2	26			6				1	7	33
Massachusetts			1	2				3							1	1	4
Michigan	2	3	1	6	2		4	18			6				11	17	35
Minnesota	2	4		10	3		6	25								0	25
Missouri	10	14	8	40	10		14	96		1	11			1	7	20	116
Montana	1	2		1				4								0	4
Nebraska		1		1				2								0	2
New Jersey		4	1	33	1		1	40								0	40
New Mexico				5				5								0	5
New York	4	34	14	19	9		46	126	6	1	9				23	39	165
North Carolina							2	2								0	2
Ohio	13	59	28	147	28		143	418	7	7	13				65	92	510
Oklahoma	3	6	2	23			12	46	1		1					2	48
Oregon								0								0	0
Pennsylvania	21	61	15	37	6		7	147	3	1	3				10	17	164
Tennessee	13	10	2	14	2		1	42		1	2					3	45
Texas		10	3	1			2	16			8					8	24
Utah	1	1		6			2	10							1	1	11
Vermont				2	1		1	4								0	4
Virginia	3	3	1	6			3	16			1				5	6	22
Washington		1						1			2					2	3
West Virginia	1	9	4	12	1	1		28		1						1	29
Wisconsin	4	6	1	23	2		2	38			1				1	2	40
Other States [a]			1					1								0	1
Total	122	413	125	689	121	16	365	1,851	50	36	136	3	0	5	257	487	2,338

[a] Includes Connecticut, Florida, Idaho, Louisiana, Nevada, Rhode Island, South Carolina, South Dakota, Wyoming, and District of Columbia.

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TABLE 14.—*Number of men employed, days worked, and number of men killed and injured per 1,000 men employed in and about* ***limestone*** *quarries in the United States during 1911.*

State.	Operators reporting.	Employees.		Total.	Days' work performed.	Average number of days worked.	Killed.		Seriously injured.		Slightly injured.		Widows.	Orphans.
		In quarry.	Outside of quarry.				Total.	Per 1,000 employed.	Total.	Per 1,000 employed.	Total.	Per 1,000 employed.		
Alabama	25	883	632	1,515	407,774	269	2	1.32	0	.....	54	35.64	1	0
Arizona	8	67	57	124	18,990	153	.....	.....	3	24.19	13	104.84	0	0
Arkansas	8	139	92	231	44,401	192	1	4.33	1	4.33	8	34.63	0	0
California	30	718	135	853	238,748	280	4	4.69	6	7.03	56	65.65	1	0
Colorado	13	380	23	403	109,485	272	0	.....	3	7.44	12	29.78	0	0
Connecticut	4	63	35	98	19,825	202	0	.....	0	.....	0	.....	0	0
Florida	4	62	49	111	25,835	233	0	.....	0	.....	0	.....	0	0
Georgia	8	139	85	224	45,272	202	0	.....	1	4.46	26	116.07	0	0
Idaho	8	37	18	55	10,031	182	0	.....	0	.....	0	.....	0	0
Illinois	86	3,281	914	4,195	1,042,791	249	12	2.86	48	11.44	372	88.68	3	3
Indiana	110	3,342	1,466	4,808	1,017,363	212	6	1.25	37	7.70	342	71.13	4	7
Iowa	68	882	121	1,003	207,415	207	4	3.99	2	1.99	44	43.87	2	1
Kansas	81	1,359	286	1,645	271,662	165	1	0.61	9	5.47	21	12.77	0	0
Kentucky	95	2,121	433	2,554	483,687	189	4	1.57	18	7.05	43	16.84	3	3
Maine	5	152	65	217	60,091	277	1	4.61	4	18.43	15	69.12	0	0
Maryland	34	485	372	857	224,796	262	5	5.83	9	10.50	33	38.51	3	12
Massachusetts	9	172	107	279	74,101	266	0	.....	2	7.17	4	14.34	0	0
Michigan	22	630	212	842	181,849	216	1	1.19	21	24.95	35	41.57	0	0
Minnesota	52	694	199	893	185,177	207	2	2.24	2	2.24	25	28.00	1	5
Missouri	152	3,015	1,130	4,145	857,913	207	7	1.69	24	5.79	116	27.99	5	5
Montana	9	140	40	180	42,349	235	0	.....	3	16.67	4	22.22	0	0
Nebraska	10	206	19	225	63,744	283	3	13.33	0	.....	2	8.89	2	1
New Jersey	18	488	28	516	137,563	267	0	.....	14	27.13	40	77.52	0	0
New Mexico	6	431	50	481	83,206	173	0	.....	4	8.32	5	10.40	0	0
New York	130	2,982	760	3,742	794,824	212	3	0.80	39	10.42	165	44.09	2	4
North Carolina	7	153	62	215	38,903	181	0	.....	0	.....	2	9.30	0	0
Ohio	173	4,460	1,757	6,217	1,450,295	233	10	1.61	48	7.72	510	82.03	8	12
Oklahoma	18	745	55	800	207,195	259	0	.....	22	27.50	48	60.00	0	0
Oregon	6	22	14	36	3,916	109	0	.....	1	27.78	0	.....	0	0
Pennsylvania	596	6,970	2,006	8,976	1,983,473	221	11	1.23	56	6.24	164	18.27	5	9
South Dakota	7	29	11	40	6,460	162	0	.....	0	.....	0	.....	0	0
Tennessee	55	1,367	365	1,732	373,530	216	3	1.73	14	8.08	45	25.98	2	0
Texas	29	608	413	1,021	235,164	230	1	0.98	7	6.86	24	23.51	0	0
Utah	23	191	33	224	57,178	255	1	4.46	10	44.64	11	49.11	1	0
Vermont	14	106	61	167	35,471	212	0	.....	2	11.98	4	23.95	0	0
Virginia	48	715	623	1,338	340,769	255	1	0.75	5	3.74	22	16.44	0	0
Washington	14	368	164	532	162,499	305	1	1.88	1	1.88	3	5.64	1	1
West Virginia	35	565	429	994	250,531	252	1	1.01	5	5.03	29	29.18	1	3
Wisconsin	115	1,437	486	1,923	405,615	211	4	2.08	13	6.76	40	20.80	3	9
Other States[a]	9	136	29	165	40,800	247	1	6.06	2	12.12	1	6.06	0	0
Total	2,144	40,740	13,836	54,576	12,240,691	224	90	1.65	436	7.99	2,338	42.84	48	75

[a] Includes Louisiana, Nevada, Rhode Island, South Carolina, Wyoming, and District of Columbia.

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TABLE 15.—*Number of men killed in and about* ***all*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total killed.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total killed.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Killed:																	
Alabama		2		1				3								0	3
Arizona								0								0	0
Arkansas								0				1				1	1
California	4	8	5	2	2			21	1							1	22
Colorado	1							1		2						2	3
Connecticut	1			1				2								0	2
Delaware								0								0	0
Florida								0								0	0
Georgia				1				1								0	1
Idaho								0								0	0
Illinois			7		2			9			2				1	3	12
Indiana				1	1		1	3		1				2		3	6
Iowa				3				3				1				1	4
Kansas		1			1			2								0	2
Kentucky			2					2	1		1					2	4
Maine				1	2			3								0	3
Maryland	1		2	1				4			1				1	2	6
Massachusetts								0			3				1	4	4
Michigan					1			1	1				1			2	3
Minnesota				1				1	1							1	2
Missouri	2	3	3					8		1						1	9
Montana								0								0	0
Nebraska			3					3								0	3
New Hampshire								0								0	0
New Jersey	1						1	2	1							1	3
New Mexico								0								0	0
New York [a]	1	1	1					3			1					1	4
North Carolina		2						2								0	2
Ohio			4	4	1			9	2		1		2		1	6	15
Oklahoma					1			1								0	1
Oregon		2	1					3								0	3
Pennsylvania	4	5	8	2	4		2	25	1		5	1			1	8	33
Rhode Island								0								0	0
South Carolina								0		1						1	1

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TABLE 16.—*Number of men seriously injured in and about* ***all*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total seriously injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosives.	Electricity (shock or burns).	Other causes.	Total seriously injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Seriously injured:																	
Alabama			1					1								0	1
Arizona			2			1		3								0	3
Arkansas								0			1					1	1
California	2	13	11	9	3		4	42	3		5				1	9	51
Colorado	4	1	6	1				12	1							1	13
Connecticut				2	2			4								0	4
Delaware				1				1								0	1
Florida								0								0	0
Georgia				1				1								0	1
Idaho								0								0	0
Illinois	1	4	9	16	7		1	38	4	2	5			1	8	20	58
Indiana	2	2	1	10	5		13	33			4				1	5	38
Iowa		1		2	2		1	6								0	6
Kansas		1	5	19	1			26								0	26
Kentucky	2		9	4	2			17			1			1	2	4	21
Maine	1	3		5	1		1	11			1				4	5	16
Maryland		4	4	1			1	10	2		7		1			10	20
Massachusetts	2	5	1	6	3		3	20			1				3	4	24
Michigan		2	5	9	2			18			5				1	6	24
Minnesota	2				1			3			1					1	4
Missouri	4	9	5	13	1		3	35	1			1				2	37
Montana	2	1		2				5								0	5
Nebraska								0								0	0
New Hampshire				1	1			2								0	2
New Jersey	1	15	7	28	5		3	59	1	1						2	61
New Mexico				5				5								0	5
New York [a]	4	17	7	14		1	7	50			1				5	6	56
North Carolina				1				1								0	1
Ohio	1	5	12	15	3		7	43	5		4				7	16	59
Oklahoma	3		2	7			10	22								0	22
Oregon		1	1					2								0	2
Pennsylvania	12	41	17	28	7		14	119	6	1	7				3	17	136
Rhode Island	5					1		6								0	6
South Carolina				1			1	2								0	2

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South Dakota	1							1								0	1
Tennessee	4	2	9	4			2	21			1					1	22
Texas	4	1	1	5				11			1				2	3	14
Utah	1	2		7	1			11								0	11
Vermont		1	7	18	4			30			3				3	6	36
Virginia	1	3	1	5	5			15	4		1					5	20
Washington	4	2	1	8	2		2	19							1	1	20
West Virginia		2		2			1	5		1	1					2	7
Wisconsin	1		3	9	3		1	17	1		2				3	6	23
Wyoming			1					1								0	1
Other States [b]	1							1								0	1
Total	65	138	128	259	61	3	75	729	28	5	52	1	1	2	44	133	862

[a] Reported by W. W. Jones, State mine inspector, Albany, N. Y.

[b] Includes Louisiana, Nevada, and District of Columbia.

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TABLE 17.—*Number of men slightly injured in and about* ***all*** *quarries in the United States during 1911.*

State.	In quarry.								Outside of quarry.								Grand total.
	Falls or slides of overburden or top.	Falls or slides of quarry material.	Explosives.	Haulage and handling material.	Falls of person.	Electricity (shock or burns).	Other causes.	Total slightly injured.	Quarry cars or locomotives.	Railway cars or locomotives.	Machinery.	Explosives.	Boiler explosions.	Electricity (shock or burns).	Other causes.	Total slightly injured.	
	1	2	3	4	5	6	7		8	9	10	11	12	13	14		
Slightly injured:																	
Alabama	15	19	2	24	11		17	88	5	2	14		1			22	110
Arizona			7	5	1	3		16								0	16
Arkansas	1	2		9	1			13			4	3			2	9	22
California	11	53	10	69	21		19	183	3	4	9			3	1	20	203
Colorado	1	3		27	2			33	2							2	35
Connecticut		3		8	2		5	18				3			1	4	22
Delaware				10			1	11								0	11
Florida								0								0	0
Georgia	15	30		18	8		1	72	5		10				1	16	88
Idaho								0								0	0
Illinois	7	83	6	120	18	6	44	284	32	9	17			4	72	134	418
Indiana	7	25	6	89	29	6	77	239	2	10	44				60	116	355
Iowa	4	14	5	31	1			55								0	55
Kansas	2	3	13	131	1		4	154			7					7	161
Kentucky	3	21	8	13	2	1	3	51	1		2				3	6	57
Maine	4	3	2	11				20		3	1					4	24
Maryland	6	12	6	24	7		4	59	3		9			1	2	15	74
Massachusetts	4	10	8	46	11		14	93			5			1	28	34	127
Michigan	3	3	1	8	2		4	21		1	7				11	19	40
Minnesota	2	28	4	17	5		7	63	2							2	65
Missouri	12	48	9	117	16		21	223	2	1	11			1	7	22	245
Montana	2	2		1				5								0	5
Nebraska		1		1				2								0	2
New Hampshire	1	2		4	1		1	9				1				1	10
New Jersey	24	25	7	90	9		5	160	1	1	13				5	20	180
New Mexico				5				5								0	5
New York [a]	8	54	14	32	12		60	180	6	1	14				27	48	228
North Carolina		2	4	91			31	128	1		2				3	6	134
Ohio	25	60	28	166	36		148	463	9	7	16		2		68	102	565
Oklahoma	16	8	2	23			12	61	1		1					2	63
Oregon	2	1	2	3				8								0	8
Pennsylvania	65	143	35	128	35		52	458	5	3	9	1			28	46	504
Rhode Island	3	2		3			1	9								0	9
South Carolina				32				32		2					4	6	38

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South Dakota	.....	7	2	.....	1	.....	.....	10	1	.....	.....	.....	.....	.....	1	2	12
Tennessee	14	10	2	17	2	2	2	49	.....	2	2	.....	.....	.....	.....	4	53
Texas	25	13	3	4	.....	.....	2	47	.....	.....	16	.....	.....	2	8	26	73
Utah	1	2	6	11	.....	.....	2	22	1	.....	30	.....	.....	5	6	42	64
Vermont	9	8	4	70	13	.....	51	155	2	.....	5	.....	.....	.....	42	49	204
Virginia	7	7	4	19	2	.....	5	44	.....	2	3	.....	.....	.....	5	10	54
Washington	11	41	1	17	2	.....	2	74	.....	1	3	.....	.....	.....	2	6	80
West Virginia	4	11	4	14	2	1	1	37	.....	1	.....	.....	.....	.....	.....	1	38
Wisconsin	4	8	7	27	4	.....	2	52	.....	1	5	8	.....	.....	3	17	69
Wyoming	.....	.....	1	1	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	0	2
Other States [b]	.....	.....	.....	.....	.....	.....	.....	0	.....	.....	.....	.....	.....	.....	.....	0	0
Total	318	767	213	1,536	257	19	598	3,708	84	51	259	16	3	17	390	820	4,528

[a] Reported by W. W. Jones, State mine inspector, Albany, N. Y.

[b] Includes Louisiana, Nevada, and District of Columbia.

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TABLE 18.—*Number of men employed, days worked, and number of men killed and injured per 1,000 men employed in and about* ***all*** *quarries in the United States during 1911.*

State.	Operators reporting.	Employees.		Total.	Days' work performed.	Average number of days worked.	Killed.		Seriously injured.		Slightly injured.		Widows.	Orphans.
		In quarry.	Outside of quarry.				Total.	Per 1,000 employed.	Total.	Per 1,000 employed.	Total.	Per 1,000 employed.		
Alabama	32	1,253	899	2,152	582,204	271	3	1.39	1	0.46	110	51.14	2	0
Arizona	17	126	75	201	38,094	190	0	.....	3	14.93	16	79.60	0	0
Arkansas	28	508	166	674	109,506	162	1	1.48	1	1.48	22	32.64	0	0
California	130	3,148	697	3,845	1,028,087	267	22	5.72	51	13.26	203	52.80	5	0
Colorado	55	700	83	783	200,782	256	3	3.83	13	16.60	35	44.70	0	0
Connecticut	48	763	406	1,169	228,308	195	2	1.71	4	3.42	22	18.82	0	0
Delaware	4	198	72	270	61,815	229	0	.....	1	3.70	11	40.74	0	0
Florida	4	62	49	111	25,835	233	0	.....	0	.....	0	.....	0	0
Georgia	44	1,509	520	2,029	343,192	169	1	.49	1	.49	88	43.37	0	0
Idaho	20	111	28	139	17,174	124	0	.....	0	.....	0	.....	0	0
Illinois	95	3,534	974	4,508	1,132,761	251	12	2.66	58	12.87	418	92.72	3	3
Indiana	114	3,566	1,493	5,059	1,095,923	217	6	1.19	38	7.51	355	70.17	4	7
Iowa	75	1,004	130	1,134	237,762	210	4	3.53	6	5.29	55	48.50	2	1
Kansas	99	1,884	526	2,410	444,159	184	2	.83	26	10.79	161	66.80	1	0
Kentucky	104	2,345	483	2,828	535,874	189	4	1.41	21	7.43	57	20.16	3	3
Maine	82	1,494	1,069	2,563	646,576	252	3	1.17	16	6.24	24	9.36	0	0
Maryland	59	1,521	770	2,291	528,097	231	6	2.62	20	8.73	74	32.30	3	12
Massachusetts	126	2,184	1,482	3,666	884,171	241	4	1.09	24	6.55	127	34.64	2	3
Michigan	30	819	406	1,225	220,960	180	3	2.45	24	19.59	40	32.65	1	0
Minnesota	91	1,478	723	2,201	449,846	204	2	.91	4	1.82	65	29.53	1	5
Missouri	171	3,577	1,273	4,850	1,048,675	216	9	1.86	37	7.63	245	50.52	6	8
Montana	16	223	54	277	66,040	238	0	.....	5	18.05	5	18.05	0	0
Nebraska	11	208	19	227	63,786	281	3	13.22	0	.....	2	8.81	2	1
New Hampshire	29	702	395	1,097	254,189	232	0	.....	2	1.82	10	9.12	0	0
New Jersey	92	2,457	616	3,073	678,102	221	3	.98	61	19.85	180	58.57	3	5
New Mexico	11	494	76	570	106,570	187	0	.....	5	8.77	5	8.77	0	0
New York	353	5,967	1,783	7,750	1,653,417	213	4	.52	56	7.23	228	29.42	2	4
North Carolina	34	1,086	475	1,561	375,060	240	2	1.28	1	.64	134	85.84	0	0
Ohio	231	6,507	2,272	8,779	2,077,323	237	15	1.71	59	6.72	565	64.36	12	15
Oklahoma	33	948	259	1,207	332,283	275	1	.83	22	18.23	63	52.20	1	0
Oregon	28	314	93	407	69,904	172	3	7.37	2	4.91	8	19.66	0	0
Pennsylvania	966	15,177	5,934	21,111	4,786,378	227	33	1.56	136	6.44	504	23.87	15	31
Rhode Island	15	380	569	949	246,104	259	0	.....	6	6.32	9	9.48	0	0
South Carolina	13	334	98	432	110,605	256	1	2.31	2	4.63	38	87.96	1	0
South Dakota	20	163	127	290	69,404	239	0	.....	1	3.45	12	41.38	0	0
Tennessee	71	2,124	442	2,566	601,185	234	3	1.17	22	8.57	53	20.65	2	9
Texas	49	913	835	1,748	394,771	226	6	3.43	14	8.01	73	41.76	3	5

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Utah	40	301	219	520	133,927	258	8	5.77	11	21.16	64	123.08	2	1
Vermont	107	2,846	940	3,786	988,553	261	8	2.11	36	9.51	204	53.88	4	8
Virginia	85	1,670	1,041	2,711	661,376	244	1	.37	20	7.38	54	19.92	0	0
Washington	48	1,784	569	2,353	580,632	247	9	3.82	20	8.50	80	34.00	5	5
West Virginia	61	913	490	1,403	323,329	230	1	.71	7	4.99	38	27.08	1	3
Wisconsin	166	2,451	1,428	3,879	859,527	222	4	1.03	23	5.93	69	17.79	3	9
Wyoming	9	61	11	72	13,653	190	1	13.89	1	13.89	2	27.78	0	0
Other States [a]	4	72	6	78	19,175	246	0	.....	1	12.82	0	.....	0	0
Total	3,920	79,879	31,075	110,954	25,325,094	228	188	1.69	862	7.77	4,528	40.81	89	129

[a] Includes Louisiana, Nevada, and District of Columbia.

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TABLE 19.—*Percentage of number killed in and about quarries in the United States during 1911, by causes, and the different classes of quarries.*

Cause.	Granite.	Trap rock.	Sandstone and bluestone.	Limestone.	Marble.	Cement rock.	Slate.	Total quarries.
In quarry:								
By falls or slides of overburden or top	17.24	37.50	14.29	11.11	.....	6.90	.....	11.70
By falls or slides of quarry material	17.24	25.00	.....	10.00	.....	24.14	18.75	13.83
By explosives	17.24	.....	7.14	30.00	.....	24.14	37.50	24.47
By haulage and handling material	6.90	12.50	21.43	10.00	.....	6.90	18.75	10.64
By falls of person	6.90	.....	35.71	6.67	50.00	.....	12.50	8.51
By electricity (shock or burns)	.....	.....	.....	.....	.....	.....	.....	.....
By other causes	6.90	.....	.....	1.11	50.00	3.45	6.25	3.19
Total killed	**72.42**	**75.00**	**78.57**	**68.89**	**100.00**	**65.53**	**93.75**	**72.34**
Outside of quarry:								
By quarry cars or quarry locomotives	3.44	12.50	.....	6.67	.....	10.34	.....	5.85
By railway cars or locomotives	10.34	.....	.....	3.33	.....	3.45	.....	3.72
By machinery	6.90	12.50	7.14	12.22	.....	6.90	.....	9.04
By explosives	.....	.....	.....	3.33	.....	.....	6.25	2.13
By boiler explosions	.....	.....	14.29	1.12	.....	.....	.....	1.60
By electricity (shock or burns)	.....	.....	.....	2.22	.....	.....	.....	1.06
By other causes	6.90	.....	.....	2.22	.....	13.78	.....	4.26
Total killed	**27.58**	**25.00**	**21.43**	**31.11**	.....	**34.47**	**6.25**	**27.66**
Grand total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 20.—*Percentage of number seriously injured in and about quarries in the United States during 1911, by causes, and the different classes of quarries.*

Cause.	Granite.	Trap rock.	Sandstone and bluestone.	Limestone.	Marble.	Cement rock.	Slate.	Total quarries.
In quarry:								
By falls or slides of overburden or top	7.27	6.76	21.43	6.65	.....	7.33	8.57	7.54
By falls or slides of quarry material	9.09	24.32	16.67	14.91	.....	21.33	17.14	16.01
By explosives	14.54	16.22	19.05	16.06	6.67	8.67	22.86	14.85
By haulage and handling material	31.81	28.38	16.67	28.21	80.00	38.00	11.43	30.04
By falls of person	9.09	8.11	11.90	5.96	6.67	4.67	17.14	7.08
By electricity (shock or burns)	.91	.....	.....	.46	.....	.....	.....	.35
By other causes	6.36	2.70	7.14	11.01	6.66	8.67	2.86	8.70
Total seriously injured	**79.09**	**86.49**	**92.86**	**83.26**	**100.00**	**88.67**	**80.00**	**84.57**
Outside of quarry:								
By quarry cars or quarry locomotives	5.45	5.41	.....	1.83	.....	6.00	2.86	3.25
By railway cars or locomotives	.....	1.35	.....	.92	.....	.....	.....	.58
By machinery	5.45	4.05	4.76	7.80	.....	2.67	8.57	6.03
By explosives	.....	.....	.....	.23	.....	.....	.....	.12
By boiler explosions	.91	.....	.....	.....	.....	.....	.....	.12
By electricity (shock or burns)	.....	.....	.....	.46	.....	.....	.....	.23
By other causes	9.09	2.70	2.38	5.50	.....	2.66	8.57	5.10
Total seriously injured	**20.91**	**13.51**	**7.14**	**16.74**	.....	**11.33**	**20.00**	**15.43**
Grand total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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TABLE 21.—*Percentage of number slightly injured in and about quarries in the United States during 1911, by causes, and the different classes of quarries.*

Cause.	Granite.	Trap rock.	Sandstone and bluestone.	Limestone.	Marble.	Cement rock.	Slate.	Total quarries.
In quarry:								
By falls or slides of overburden or top	4.34	14.05	15.56	5.22	.....	9.28	24.32	7.02
By falls or slides of quarry material	13.89	18.18	12.89	17.66	.....	19.62	24.33	16.94
By explosives	4.20	4.54	1.33	5.35	.....	4.11	13.51	4.70
By haulage and handling material	38.06	25.21	40.00	29.47	57.94	42.42	13.51	33.92
By falls of person	6.66	6.61	10.67	5.18	11.22	3.88	6.76	5.38
By electricity (shock or burns)	.....	.....	.44	.68	1.87	.....	.....	.42
By other causes	13.46	14.05	8.00	15.61	16.82	8.23	.....	13.21
Total slightly injured	**80.61**	**82.64**	**88.89**	**79.17**	**87.85**	**87.54**	**82.43**	**81.89**
Outside of quarry:								
By quarry cars or quarry locomotives	1.74	.83	1.78	2.14	2.80	1.53	.....	1.85
By railway cars or locomotives	.72	1.65	1.33	1.54	.....	.35	.....	1.13
By machinery	3.91	9.09	3.11	5.82	9.35	5.64	12.16	5.72
By explosives	1.30	1.24	.....	.13	.....	.12	.....	.35
By boiler explosions	.....	.....	.89	.....	.....	.12	.....	.07
By electricity (shock or burns)	.14	1.24	.....	.21	.....	.82	1.35	.38
By other causes	11.58	3.31	4.00	10.99	.....	3.88	4.06	8.61
Total slightly injured	**19.39**	**17.36**	**11.11**	**20.83**	**12.15**	**12.46**	**17.57**	**18.11**
Grand total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 22.—*Number of men employed and number of men killed and injured in and about all mines and quarries in the United States during 1911.*

Mine.	Employed.	Killed.		Seriously injured.		Slightly injured.	
		Total.	Per 1,000 employed.	Total.	Per 1,000 employed.	Total.	Per 1,000 employed.
Quarries	110,954	188	1.69	862	7.77	4,528	40.81
Coal mines	728,348	2,719	3.73	9,106	12.50	22,228	30.65
Metal mines	165,979	695	4.19	4,169	25.12	22,408	135.01
Total	1,005,281	3,602	3.58	14,137	14.11	49,164	48.95

TABLE 23.—*Percentage of persons killed and seriously injured by different causes in quarries, metal mines, and coal mines in the United States during 1911.*

Cause.	Per cent killed.			Per cent seriously injured.		
	Quarries.	Metal mines.	Coal mines.	Quarries.	Metal mines.	Coal mines.
By falls of overburden, roof, quarry material, ore, or coal	25.53	32.52	48.79	23.55	31.37	43.57
By explosives	26.60	11.23	5.56	14.97	4.31	3.48
By haulage and handling rock, ore, or coal	20.21	7.63	19.14	33.87	19.05	30.21
By falls of person	8.51	15.39	1.19	7.08	6.07	.34
By electricity	1.06	2.16	3.61	.58	.14	.79
By machinery	9.04	3.07	1.86	6.03	12.19	5.29
Other causes	9.05	28.00	19.85	13.92	26.87	16.32
Total	100.00	100.00	100.00	100.00	100.00	100.00

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BULLETIN 10. The use of permissible explosives, by J. J. Rutledge and Clarence Hall. 1912. 34 pp., 5 pls., 4 figs.

BULLETIN 17. A primer on explosives for coal miners, by C. E. Munroe and Clarence Hall. 61 pp., 10 pls., 12 figs. Reprint of United States Geological Survey Bulletin 423.

BULLETIN 20. The explosibility of coal dust, by G. S. Rice, with chapters by J. C. W. Frazer, Axel Larsen, Frank Haas, and Carl Scholz. 204 pp., 14 pls., 28 figs. Reprint of United States Geological Survey Bulletin 425.

BULLETIN 44. First national mine-safety demonstration, Pittsburgh, Pa., October 30 and 31, 1911, by H. M. Wilson and A. H. Fay, with a chapter on the explosion at the experimental mine, by G. S. Rice. 1912. 75 pp., 7 pls., 4 figs.

BULLETIN 46. An investigation of explosion-proof mine motors, by H. H. Clark. 1912. 44 pp., 6 pls., 14 figs.

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BULLETIN 52. Ignition of mine gases by the filaments of incandescent electric lamps, by H. H. Clark and L. C. Ilsley. 1913. 31 pp., 6 pls., 2 figs.

BULLETIN 65. Oil and gas wells through coal beds; papers and discussions, by G. S. Rice, O. P. Hood, L. M. Jones, A. S. Heggem, and others. 1913. 101 pp., 1 pl., 11 figs.

TECHNICAL PAPER 11. The use of mice and birds for detecting carbon monoxide after mine fires and explosions, by G. A. Burrell. 1912. 15 pp.

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MINERS' CIRCULAR 5. Electrical accidents in mines; their causes and prevention, by H. H. Clark, W. D. Roberts, L. C. Ilsley, and H. F. Randolph. 1911. 10 pp., 3 pls.

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MINERS' CIRCULAR 9. Accidents from falls of roof and coal, by G. S. Rice. 1912. 16 pp.

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MINERS' CIRCULAR 11. Accidents from mine cars and locomotives, by L. M. Jones. 1912. 16 pp.

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